WEATHER IN THE UNITED STATES

THE WEATHER ELEMENTS

By P. C. DAY

GENERAL CONDITIONS

May, 1929, was notable chiefly on account of the persistence of low temperatures, though at no time did frost seriously threaten the staple crops. The continued cold, however, augmented by frequent rains and wet soil, delayed to some extent the advance of the season which was late over wide areas of the interior and southern parts of the country.

PRESSURE AND WINDS

The month opened with cyclonic centers located over lower Michigan and central Texas, and extensive areas of precipitation associated with thunderstorms had prevailed during the preceding 24 hours from the Great Lakes westward to the northern Rocky Mountains and from Arkansas and Missouri eastward to the Atlantic coast, some snow occurring in the more northern districts. By the morning of the 2d the Michigan center had largely disappeared, but the Texas one had developed materially and was central over the lower Ohio Valley as a severe storm attended by local high winds, tornadoes, hail and other storms, heavy rains, local snows, and material damage to property of various kinds. Nearly 40 persons were killed and many injured by tornadoes which occurred in scattered areas from Arkansas and Missouri eastward to near the Atlantic coast. Nine persons were killed by a tornado at Wheatley, Ark., on the afternoon of the 1st, and 13 at Rye Cove, Va., on the 2d, and 15 or more additional deaths occurred at other scattered points in Maryland, Virginia and elsewhere in the storm area. The total losses from these storms are estimated as amounting to more than $3,000,000. This cyclone moved northeastward to the St. Lawrence Valley during the following day, increasing somewhat in intensity over the Atlantic coast districts without, however, the severe local storms that marked the two preceding days, but with heavy rains continuing in many eastern sections and snow occurring locally at many places in the northern portions of the storm area. By the morning of the 4th the storm had moved northwestward to the vicinity of Hudson Bay with decreasing intensity.

At the morning observation of the 6th low pressure had overspread the southern Plains and scattered rainfall, generally light, had occurred over a narrow area from the middle Rocky Mountains eastward and southeastward to Florida and the middle Atlantic coast and thence to New England and eastern Canada. By the following morning the rain area had become general over most eastern districts, the falls becoming rather heavy at points in the Ohio Valley and Southeastern States, but in most other parts of the country clear weather prevailed, continuing till about the end of the first decade, except for local rains in portions of the Gulf States.

The first half of the second decade had rather rainy conditions that gradually overspread the central valleys, beginning about the 11th and slowly extending eastward during the following several days reaching the Atlantic coast by the 15th, at which time another low-pressure area had advanced to the western Lake region; by the morning of the 16th this low-pressure area was central near northern New England and precipitation had occurred over considerable areas from the Mississippi Valley eastward over the Lake region and Ohio Valley and locally in parts of the Gulf States and New England.

At the morning observation of the 18th cyclonic conditions existed in the Southern Plains and west Gulf regions with local heavy rains occurring. By the following morning rain had overspread most districts to the eastward and heavy rains had occurred at many additional points in the Gulf States and had extended into the Ohio Valley and East Gulf States. At the end of the second decade the rain area was confined to a rather narrow strip along nearly the entire Atlantic coast from Florida to Maine, continuing during the following day over the same districts save for northern New England.

The early part of the third decade was mostly without rain except along the Atlantic coast, as stated above, and for a few local showers elsewhere, until about the 26th, when rainy conditions set in over the Rocky Mountain region and portions of the South from Texas eastward to and including portions of the lower Ohio Valley. During the following day the rain area extended to other parts of the West and eastward over the northern Plains to the upper Lakes and continued in portions of the South, heavy rains being reported from portions of Alabama and Georgia.

Scattered rains fell during the last few days of the month in many interior and some southern districts, but no general cyclone crossed any large part of the country.

Over the far western districts the month was mainly without important cyclonic formation as is usually the case in May, and there was little rain or other atmospheric disturbance.

The average sea-level pressure for the month was above normal in all parts of the United States, save over a small area in central and southern California, and it was also above normal in Canada as far as observations disclose. The change in pressure from the preceding month was likewise positive in all parts of the country save for the portions of California noted above and like conditions existed in Canada also.

The important winds of the month were mainly of the local character common to the warm season and occurred mainly on the first and second days and also during various parts of the second and third decades, a few occurring on most days of each and widely scattered in location.

The details of the more important storms of the month appear in the special table at the end of this section.

TEMPERATURE

May, on the whole, was a cold month, though there were few cases of sudden and sharp changes to lower temperatures, the most notable important cases of decided falls in temperature being on the 2d and 3d, when changes from 20° to 30° cooler occurred following the passage of an area of low pressure. This moved across the central valleys and eastern districts with corresponding high temperatures and was followed by an anticyclone of considerable strength, so temperature dropped to near or below the freezing point in some interior and western portions. Marked falls occurred again on the 15th to 17th when high pressure over-

spread the northern and central districts from the Rocky Mountains eastward, bringing temperatures within a few degrees of freezing at many points near the northern border.

The following resumé by weekly periods shows the main features of the temperature conditions during the several portions of the month. The first week was abnormally cold, particularly in the interior valleys and Northwest where the weekly averages ranged from 6° to 12° below normal, and hard freezes occurred in some North-Central States. In other sections, however, the weekly averages were not so low and in portions of the Atlantic Coast States and in the South and far West they were somewhat above normal. During the week ended May 14, the weather continued colder than normal over most districts from the Rocky Mountains eastward, though the negative departures were not large; districts near the Gulf, however, had slightly more than normal warmth and the week was mainly warmer than normal in the Plateau and Pacific Coast States. Some freezing temperatures were reported this week along the northern border and in the elevated areas of the West. The week ended the 21st continued cooler than normal over most central and eastern districts save along the immediate Atlantic coast, and it continued warmer than normal as in the preceding week over most far Western States; the week, as a whole, showing slightly greater negative departures from the normal than that preceding. The week ended the 28th continued cooler than normal over the eastern portions during the earlier part, but later in the week there was a reaction to warmer in the Northwest and the latter part had temperatures above normal in most eastern districts, the averages for the week being materially above normal from the Great Lakes and upper Mississippi Valley westward, and as a whole, continued warmer than normal over most of the far West. The week, as a whole, was cooler than normal in the East and South although temperatures were becoming rather high as the week closed over eastern districts. The last three days were unseasonably warm over the eastern half of the country, but about normal temperatures prevailed in other districts.

The month, as a whole, was distinctly cool over all parts of the country, save for small areas along or near the Atlantic coast and over the Plateau and Pacific Coast States, where the monthly averages were somewhat above normal. In portions of the Missouri, Mississippi, and Ohio Valleys, and the Lake region the negative departures ranged from 2° to 5° per day.

The maximum temperatures were above 90° at some time during the month in all the States, and above 100° at points in most of the Southwestern States, the highest for the month, 110°, occurring in southeastern California. The extreme heat was registered mainly during the last few days.

The lowest temperatures were recorded early in the month as a rule, and they were below freezing for short periods in most States except those of the Southeast. The lowest reported, 5° below zero, occurred at an exposed point in Wyoming, though temperatures only a few degrees higher occurred at a number of other points in the high western mountains.

PRECIPITATION

May was a wet month over most districts from New Mexico northeastward to the middle Great Lakes and thence eastward to the Atlantic coast. Within this area the monthly precipitation was nearly everywhere above the normal falls of May and over some areas the amounts were the greatest of record for that month, notably in central and southwestern Missouri and near-by areas of eastern Kansas and western Arkansas, in central and southern Texas, and at points in New Mexico. At St. Louis, Mo., the total fall for May was the greatest in nearly 60 years of official Government records and similar conditions obtained at points in Texas, Galveston reporting the greatest May amount in over half a century, with the maximum fall of record for short periods, 5.18 inches in two hours, 3.32 inches in one hour, and 2.18 inches in 30 minutes, all on the 18th. On the other hand, there was a marked deficiency in precipitation at points in Iowa, Dubuque reporting the least monthly amount for May in 55 years of observations at that place, and precipitation was generally less than normal for May from the Lake region westward and southwestward to the Pacific coast.

The rainfall, where less than normal, was so distributed, however, that no large area was without some precipitation for unduly long periods and moisture was, in the main, sufficient for the needs of crop growth.

SNOWFALL

The falls of snow usual for May occurred in the western mountain regions though there appears to have been but little in the mountains of California. However, some large amounts were measured in the high elevations of the central Rocky Mountains, with a maximum total of 59 inches in Colorado and considerable but smaller amounts in the nearby mountains of New Mexico and Wyoming, and lesser falls in Montana, with scattered falls in the mountains of the Plateau region.

Over districts from the Rocky Mountains eastward snow was light along the northern border, but further south in a small area from central Missouri northeast to Michigan an unusual fall of snow occurred on the night of May 1–2, continuing into the 3d in northern Michigan. In this area depths ranging up to 5 or even 10 inches occurred, and at many points in the area of snowfall it was the latest occurrence of record as well as the heaviest fall ever reported in May.

RELATIVE HUMIDITY

From the middle and southern Rocky Mountains eastward the percentages of relative humidity were nearly everywhere above normal, but to the northward, also to westward of the Continental Divide humidity percentages were generally less than normal, and in many sections the negative departures were large. At Yuma, Ariz., the average of the afternoon readings was only 11 per cent, the lowest of record for May. In some of the southern sections, notably from New Mexico eastward, the percentages were markedly high, ranging up to 10 or even 15 per cent above the normal.